

COLLAPSIBLE KENNEL FOR USE WITH CAPPED TRUCK BEDS

Background of the Invention

This invention relates generally to animal kennels for use with truck beds and,
5 more particularly, to a collapsible kennel for use with capped truck beds that may be easily installed and uninstalled by a user and can be easily transported and stored.

Transporting dogs in a truck bed is often a difficult and dangerous undertaking. If the dog is not restrained, it may be tossed into the sides or even out of the bed when the vehicle makes sudden stops or hard turns. A truck cap (also known as a topper, shell, or 10 camper shell) provides some protection but still leaves the dog at risk and allows it to roam around the bed without restraint. Harnesses and leashes provide restraint but can harm the dog during abrupt movements. Other than permanently installing a kennel, the only option is to transport dogs in a portable kennel that is securely tied down to the bed. This is a time-consuming and cumbersome task for people who do not wish to install a permanent kennel. 15 This category of people would include those who need full use of their truck bed and those who only occasionally transport their dog(s) for hunting trips, vacations, etc.

Currently available kennels that are made for truck beds often occupy an excessive amount of space in the bed, such as in U.S. Pat. Nos. 6,499,434 and 5,147,103. They also tend to be heavy, difficult to install, and expensive. Many are not compatible with 20 truck caps or would require permanent modifications to the cap, such as in U.S. Pat. Nos. 6,499,434 and Des. 397,082. Additionally, the existing kennels are not collapsible and require large storage space when not in use.

Therefore, it is desirable to have a kennel compatible with capped trucks that uses a limited amount of space, is easily installed and uninstalled by the user, does not require

permanent modifications to the cap, is collapsible into a manageable package for storage, provides comfortable housing, and is relatively light and inexpensive.

Summary of the Invention

5 A collapsible kennel for use with capped truck beds according to the present invention includes a foldable floor section coupled to one or two foldable wall sections. When assembled and in use, the collapsible kennel rests on a truck bed's side rails, leaving cargo space available in the truck bed. The truck cap provides two opposing walls and a ceiling while the collapsible kennel provides a floor and at least one wall. If only one wall of
10 the collapsible kennel is used, the collapsible kennel must be positioned against the truck cab to provide the opposing wall. The collapsible kennel further includes a divider capable of providing two separate areas for transporting multiple animals and doors for animal ingress and egress. When collapsed, the collapsible kennel can be easily transported and stored due to its configuration and size.

15 Therefore, a general object of this invention is to provide a kennel compatible with capped trucks that offers comfortable housing for an animal.

Another object of this invention is to provide a kennel, as aforesaid, that is easily installed and uninstalled by the user and does not require permanent modifications to the cap.

20 Still another object of this invention is to provide a kennel, as aforesaid, that is collapsible into a manageable package for storage and easily transported.

Yet another object of this invention is to provide a kennel, as aforesaid, that is capable of providing two separate areas for transporting multiple animals.

25 Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings, wherein is set forth by way of illustration and example, embodiments of this invention.

Brief Description of the Drawings

FIG. 1a is a front perspective view of a collapsible kennel according to a preferred embodiment of the present invention;

FIG. 1b is a rear perspective view of the collapsible kennel as in FIG. 1;

5 FIG. 2 is a front view of the collapsible kennel as in FIG. 1 in use on a capped pickup truck;

FIG. 3 is an exploded view of the collapsible kennel as in FIG. 1;

FIG. 4a is a front view of the collapsible kennel as in FIG. 2 being collapsed;

10 FIG. 4b is a front view of the collapsible kennel as in FIG. 4a being further collapsed;

FIG. 5a is a front view of the collapsible kennel as in FIG. 4b being further collapsed;

FIG. 5b is a front view of the collapsible kennel as in FIG. 2 in a fully collapsed configuration;

15 FIG. 6a is another perspective view of the collapsible kennel as in FIG. 1;

FIG. 6b is an isolated perspective view on an enlarged scale of a door closure arrangement as in FIG. 6a;

20 FIG. 6c is an isolated perspective view on an enlarged scale of a side support bracket and clamp bolt and a panel bolt connecting a side floor panel to a side front panel as in FIG. 6a;

FIG. 7a is a front view of a floor section removed from the collapsible kennel of FIG. 1a;

FIG. 7b is a sectional view taken along line 7b—7b of FIG. 7a;

25 FIG. 8a is a front perspective view of a collapsible kennel according to another embodiment of the present invention;

FIG. 8b is a rear perspective view of the collapsible kennel as in FIG. 8a being collapsed;

FIG. 9a is a perspective view of the collapsible kennel as in FIG. 8b being further collapsed;

5 FIG. 9b is a perspective view of the collapsible kennel as in FIG. 9a being further collapsed;

FIG. 10a is a perspective view of the collapsible kennel as in FIG. 1 with an alternate door;

10 FIG. 10b is an isolated perspective view on an enlarged scale of an alternate door as in FIG. 10a;

FIG. 11a is a perspective view of a rear wall compatible with the collapsible kennel as in FIG. 1;

FIG. 11b is a perspective view of the rear wall as in FIG. 11a combined with the collapsible kennel as in FIG. 1; and

15 FIG. 11c is another perspective view of the rear wall as in FIG. 11a combined with the collapsible kennel as in FIG. 1.

Drawings—Reference Numerals

100	collapsible kennel	161	upper lip of side support bracket
110	center floor panel	162	bottom lip of side support
112	panel hinge		bracket
114	back support bracket	163	vertical wall of side support
116	cavities in center floor panel		bracket
120	side floor panel	167	side support bracket hole
122	bottom face of side floor panel	168	clamp bolt
123	outer edge of side floor panel	169	opening in upper lip of side
126	interlocking support mechanism		support bracket
127	handle	170a	folding-gate
130	center front panel	171a	slider
132	rear face of center front panel	172a	folding-gate track
133	panel hinge	173a	spring
140	side front panel	174a	folding-gate eyelet
144	bottom surface of side front	175a	side front panel eyelet
	panel	170b	wire grate door
145	inner surface of side front panel	172b	spring-loaded hinge
146	top surface of side front panel	174b	sliding bolt assembly
147	outer surface of side front panel	175b	bolt catch
148	panel bolt	177b	truck cap eyelet
149	door opening	178	cord
150	divider base	200	collapsible kennel
152	divider insert		embodiment
160	side support bracket	220	floor panel

221	top face of floor panel	250	divider
222	bottom face of floor panel	251	divider hinge
224	front lip of floor panel	254	bracket
229	holes in front lip of floor panel	255	divider hole
233	panel hinge	256	bracket hole
240	front panel	258	divider bolt
241	front face of front panel	300	collapsible kennel embodiment
242	rear face of front panel	301	rear enclosure
244	bottom surface of front panel	380	center rear panel
245	inner surface of front panel	387	outer surface of center rear panel
246	top surface of front panel	390	side rear panel
247	outer surface of front panel	394	bracket
248	front panel hole	398	bolts
249	panel bolt	399	window

Description of the Preferred Embodiment

A collapsible kennel for use with capped truck beds according to the present invention will now be described in detail with reference to Figs. 1 through 11c of the accompanying drawings. A collapsible kennel 100 according to a now preferred embodiment 5 includes a center floor panel 110 having a generally rectangular configuration fixedly attached to a center front panel 130 and pivotally coupled to a pair of side floor panels 120 by a set of panel hinges 112, each floor panel having generally rectangular configurations. A back support bracket 114 is fixedly attached to the center floor panel 110 opposite the center front panel 130 and rests on a back rail of a truck bed to help support the weight of the 10 collapsible kennel 100 and its contents.

The center floor panel 130 defines a horizontal axis relative to the floor panels 110 that are hingedly coupled thereto. More particularly, each floor panel 110 is separately movable between an extended use configuration planar with the center floor panel 130 and a folded storage configuration generally perpendicular relative to the center floor panel 130 15 (Figs. 4b to 5b).

A side support bracket 160 is positioned along an outer edge 123 of each side floor panel 120 and fixedly attached to each side floor panel 120 at a bottom face 122 thereof. An upper lip 161 of each side support bracket 160 can rest on a respective side rail of the truck bed to support the weight of the collapsible kennel 100 and its contents. A bottom lip 20 162 of each side support bracket 160 defines holes 167. A clamp bolt 168 passes through each hole 167, creating a C-clamp, and can secure the collapsible kennel 100 to a respective side rail of the truck bed. This is best seen in Figs. 4a, 4b, and 6c. Each upper lip 161 has an opening 169 which acts as a convenient carrying handle when the collapsible kennel 100 is in a fully collapsed configuration, as shown in Fig. 5b.

Inside each side floor panel 120 is an interlocking support mechanism 126 that slides into cavities 116 in the center floor panel 110 by sliding a handle fastener 127 toward the center floor panel 110. This is best shown in Figs. 7a and 7b and, in effect, produces a single rigid floor panel for supporting the weight of the collapsible kennel 100 and its 5 contents. The interlocking support mechanism 126 is preferably made of metal. The interlocking mechanism 126 and handle 127 is the preferred fastener although other slidable fasteners would work. The slidable handles 127 may also be referred to as first and second floor panel fasteners. The slidable fastener arrangement is useful for holding and releasing the floor panels 120 between the extended and storage configurations described above. For 10 example, the slidable handles 127 may be slidably moved such that the prongs of the interlocking support mechanism 126 cooperatively engage the cavities 116 of the center floor panel 130. It is understood, of course, that the locking action of the floor fasteners described herein are only effective when the floor panels 120 are in the extended configurations, i.e. such that the cavities 116 are situated to receive the prongs..

15 A divider base 150 is fixedly attached atop the center floor panel 110 and fixedly attached to a rear face 132 of the center front panel 130, adding structural support to the collapsible kennel 100. A divider insert 152 is removably attached to the divider base 150. The divider base 150 and insert 152 may be collectively referred to as a partition as they effectively divide the interior space of the kennel 100 into separate kennel spaces.

20 A pair of side front panels 140 are pivotally coupled to the rear face 132 of the center front panel 130 by a set of panel hinges 133. Each side front panel 140 includes a generally rectangular configuration having a linear bottom surface 144, a linear inner surface 145, and linear top surface 146, but with an outer top surface 147 being complementary to the shape of a truck cap and a truck bed's side rail. The front panels 130 are pivotally movable 25 on respective hinges 133 between open and closed configurations (Figs. 4a and 4b). It is

understood that the center front panel 130 defines a vertical axis about which the front panels 130 are designed to pivot. It should be appreciated that front and rear walls of the truck cap itself may provide the equivalent of the front panels 140 if the floor panels 120 are appropriately dimensioned and positioned in a truck bed.

5 The side front panels 140 may be secured to the side floor panels 120 by two removable panel bolts 148, as best seen in Fig. 6c. The panel bolts 148 may be referenced as first and second front panel fasteners that may be selectively extended through respective floor panels 120 into cooperative engagement with respective front panels 130, whereby to releasably hold the front panels at closed configurations or to release them to open 10 configurations. It is understood that the front panels and front panel fasteners are separately operable.

Each side front panel 140 defines a door opening 149 for animal ingress and egress. The preferred door to cover door opening 149 is a folding-gate 170a, shown in Figs. 10a and 10b. A pair of sliders 171a on the folding-gate 170a move along a track 172a that is 15 fixedly secured to the side front panel 140. A spring 173a attaches the sliders 171a to make the folding-gate 170a self-closing. The spring 173a should be stiff enough to prevent a dog from opening the folding-gate 170a with his paw or snout. An eyelet 174a is fixedly attached to each folding-gate 170a, and an eyelet 175a is fixedly attached to each side front panel 140 directly above each eyelet 174a. This is best seen in Fig. 10b. A cord or cable can then be 20 secured to each eyelet 174a, pass through each eyelet 175a, and be pulled horizontally by a user to exert a vertical force and open each folding-gate 170a.

The door opening 149 may alternatively be covered by a wire grate door 170b. The wire grate door 170b is pivotally coupled to the side front panel 140 by a set of spring-loaded hinges 172b. A conventional sliding bolt assembly 174b is fixedly attached to the 25 wire grate door 170b, and a compatible bolt catch 175b is fixedly attached to the side front

panel 140 where the sliding bolt assembly 174b and the bolt catch 175b can connect. A cord or cable 178 can then be secured to the sliding bolt assembly 174b and pass through an eyelet 177b that is permanently mounted to the truck cap. Eyelet 177b provides the angle needed for the cord 178 to release the bolt in the sliding bolt assembly 174b and pull the wire grate 5 door 170b open (Fig. 2).

The combined widths of the center floor panel 110, the two side floor panels 120, and the two vertical walls 163 of side support brackets 160 are preferably slightly less than the distance between the truck bed's side rails. When unfolded and assembled, the 10 collapsible kennel 100 may be placed with the upper lips 161 of side support brackets 160 atop the truck bed's side rails, leaving cargo space available in the truck bed. When positioned against the truck cab and secured by clamp bolts 168, the collapsible kennel 100 would provide a floor and one wall of a kennel, the truck cab would provide a second wall, and the truck cap would provide the final two walls and ceiling. Since truck beds come in 15 various widths, various combinations may be needed to ensure a good fit with different trucks. Multiple center floor panels 110 and center front panels 130 may be provided to allow the user to assemble the collapsible kennel 100 with the components that match the width of his truck bed. Truck caps also come in different sizes, and while this will not be significant in most cases, some caps may leave enough of a gap for an animal to climb out of 20 the kennel. In such cases, the side front panels 140 can be custom made or extra material can be added to cover the gap. A flexible frame may also be added that could slide up to meet the contours of the cap.

In use, the collapsible kennel 100 may be collapsed as shown in Figs. 4a through 5b. First, panel bolts 148 may be removed and side front panels 140 are folded in toward the divider base 150 (Figs. 4a and 4b). Next, clamp bolts 168 are loosened, and handles 127 are 25 slid away from the center floor panel 110 to disengage the interlocking support mechanism

126. The side floor panels 120 are then folded upwards toward the divider base 150 as shown in Figs. 5a and 5b. Fig. 5b shows the collapsible kennel 100 fully collapsed into a one-piece package.

A collapsible kennel 200 according to another embodiment of the present invention is shown in Figs. 8a through 9b and includes a construction substantially similar to the construction previously described except as specifically noted below. More particularly, the collapsible kennel 200 according to this embodiment includes two floor panels 220 having generally rectangular configurations pivotally coupled along a bottom face 222 by a set of panel hinges (not shown). Each floor panel 220 has a front lip 224 defining holes 229. A divider 250 is pivotally coupled to one of the floor panels 220 by a divider hinge 251 at a top face 221.

A pair of front panels 240 are pivotally coupled together by a panel hinge 233 situated on a front face 241 of each of respective front panels 240. The front panels 240 have a linear bottom surface 244 perpendicular to a linear inner surface 245 perpendicular to a linear top surface 246. In the same manner described previously, the linear top surface 246 transitions into an outer surface 247 designed to approximate the shape of a truck cap. The front panels 240 have holes 248 that correspond to holes 229 when the front panels 240 are lined up with the floor panels 220. Panel bolts 249 selectively couple the front panels 240 with the floor panels 220. A bracket 254 having a hole 256 is fixedly attached to a rear face 242 of one front panel 240.

The divider 250 has a hole 255 that corresponds to hole 256 of bracket 254 when the front panels 240 are combined with the floor panels 220 and the divider 250 is in a vertical position. Divider bolt 258 fastens the divider 250 with the bracket 254, maintaining the divider 250 in a vertical position.

Preferably, the combined widths of the two floor panels 220 are slightly more than the distance between the truck bed's side rails. When unfolded and assembled, the collapsible kennel 200 may be placed atop the truck bed's side rails, leaving cargo space available in the truck bed. When positioned against the truck cab, the collapsible kennel 200 5 would provide a floor and one wall of a kennel, the truck cab would provide a second wall, and the truck cap would provide the final two walls and ceiling.

Figs. 8a through 9b show the collapsible kennel 200 being collapsed. First, divider bolt 258 is removed and the divider 250 is folded to the connected floor panel 220. Next, panel bolts 249 are removed and the front panels 240 are separated from the floor 10 panels 220. The floor panels 220 are then folded, causing the bottom faces 222 to abut, and the front panels 240 are folded, causing the front faces 241 to abut.

A collapsible kennel 300 according to another embodiment of the present invention is shown in Figs. 11a through 11c and includes a construction substantially similar to the construction first described above except as specifically noted below. More 15 particularly, the collapsible kennel 300 according to this embodiment includes a center rear panel 380 pivotally coupled to a pair of side rear panels 390 by a set of panel hinges (not shown). The side rear panels 390 can include windows 399.

A bracket 394 with holes (not shown) fixedly attached to the bottom of outer surface 387 of the center rear panel 380. Bolts 398 pass through the bracket holes to create a 20 C-clamp for attaching the rear enclosure 301 to the center floor panel 110 of the collapsible kennel 100. The back support bracket 114 must be removed from the collapsible kennel 100.

When unfolded and assembled, the collapsible kennel 300 may be placed with the upper lips 161 of side support brackets 160 atop the truck bed's side rails, leaving cargo space available in the truck bed. The collapsible kennel 300 may be positioned anywhere 25 along the truck bed's side rails and secured by clamp bolts 168. The collapsible kennel 300

would provide a floor and two opposing walls of a kennel, and the truck cap would provide the final two walls and ceiling.

The center rear panel 380 is preferably more narrow and shorter than center front panel 130, and the side rear panels 390 is preferably more narrow and shorter than the side 5 front panels 140. This allows rear enclosure 301 to fold into the one-piece package of the collapsible kennel 100 when both the collapsible kennel 100 and the rear enclosure 301 are completely collapsed.

It is understood that while certain forms of this invention have been illustrated and described, it is not limited thereto except insofar as such limitations are included in the 10 following claims and allowable functional equivalents thereof.